

CorpsMap User's Guide
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CorpsMap User's Guide

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Introduction and Overview of CorpsMap

CorpsMap is a web-based Geographic Information System designed to deliver geographic information to members of the Corps of Engineers.

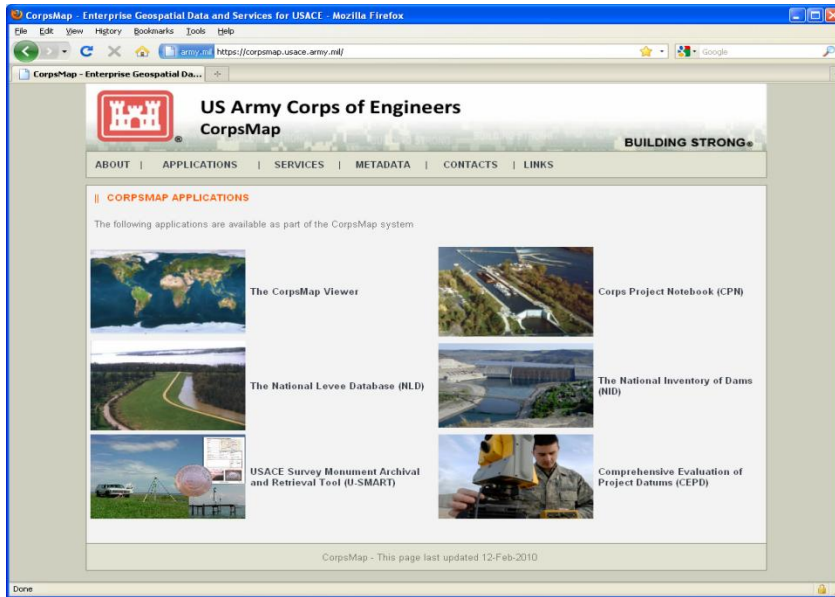
CorpsMap contains GIS data from the Corps, other Federal agencies and other private and public organizations. Corpsmap also links to Corpwide-databases to geographic information in order bring data and information to members of the Corps of Engineers.

CorpsMap technology is used in a variety of web-based mapping applications. Some USACE divisions and districts have local installations of web mapping applications using CorpMap technology. While this guide is written for the CorpsMap UOC viewer, some features will be similar to local CorpsMap installations. However, some local versions may be customized and may look different and operate differently than the UOC viewer.

CorpsMap User's Guide

The CorpsMap USACE Operations Center (UOC) Viewer is located at: <https://corpsmap.usace.army.mil> Contact your district's GIS Point of Contact to find out if you district, division or organization has a local installation of CorpsMap.

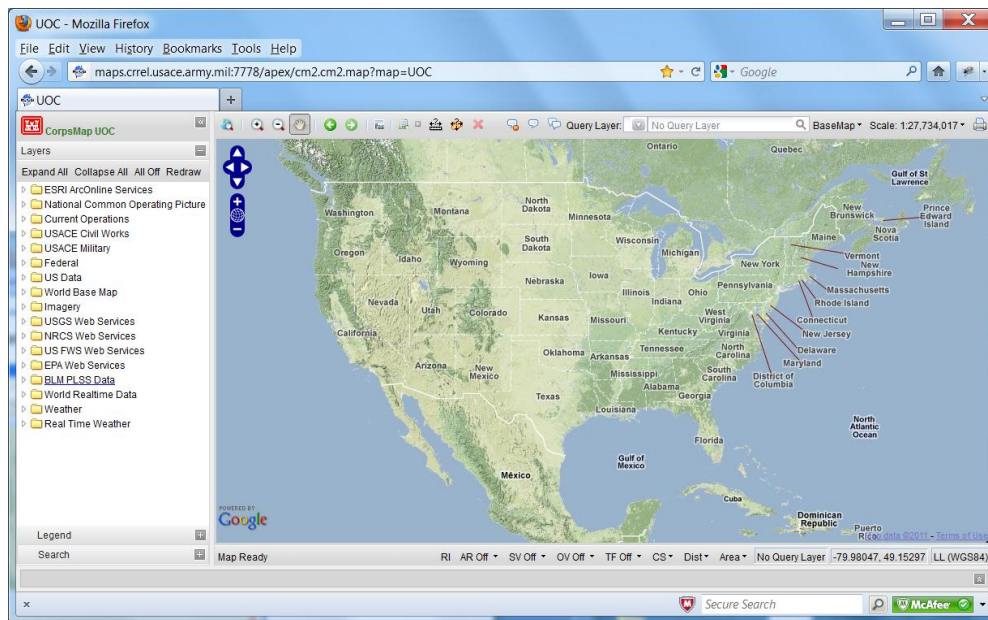
Currently, you must be behind the Corps firewall (inside most Corps offices) or using a Virtual Private Network (VPN) connection to the Corps network in order to use CorpsMap



The home page has links to six different CorpsMap applications. The first is the primary US Army Corps of Engineers Headquarters Operations Center (UOC) CorpsMap viewer (the UOC viewer).

1. CorpsMap Viewer (USACE Headquarters Operations Center)
2. Corps Project Notebook
3. National Levee Database (NLD)
4. National Inventory of Dams (NID)
5. USACE Survey Monument Archival and Retrieval Tool (U-SMART)
6. Comprehensive Evaluation of Project Datum (CEPD)

Click the words or the image next to where it says “The CorpsMap Viewer”. A new tab will open in your browser, and should look something like this:



Note: If your computer has accessed CorpsMap before, the settings from the previous session may still be in the system. In this case, the map may automatically zoom in to the last area, and the map may also turn on layers that had been accessed before. If that is the case, clicking the “Zoom to maximum map extent” button in the upper left of the display will focus the map on the continental United States.

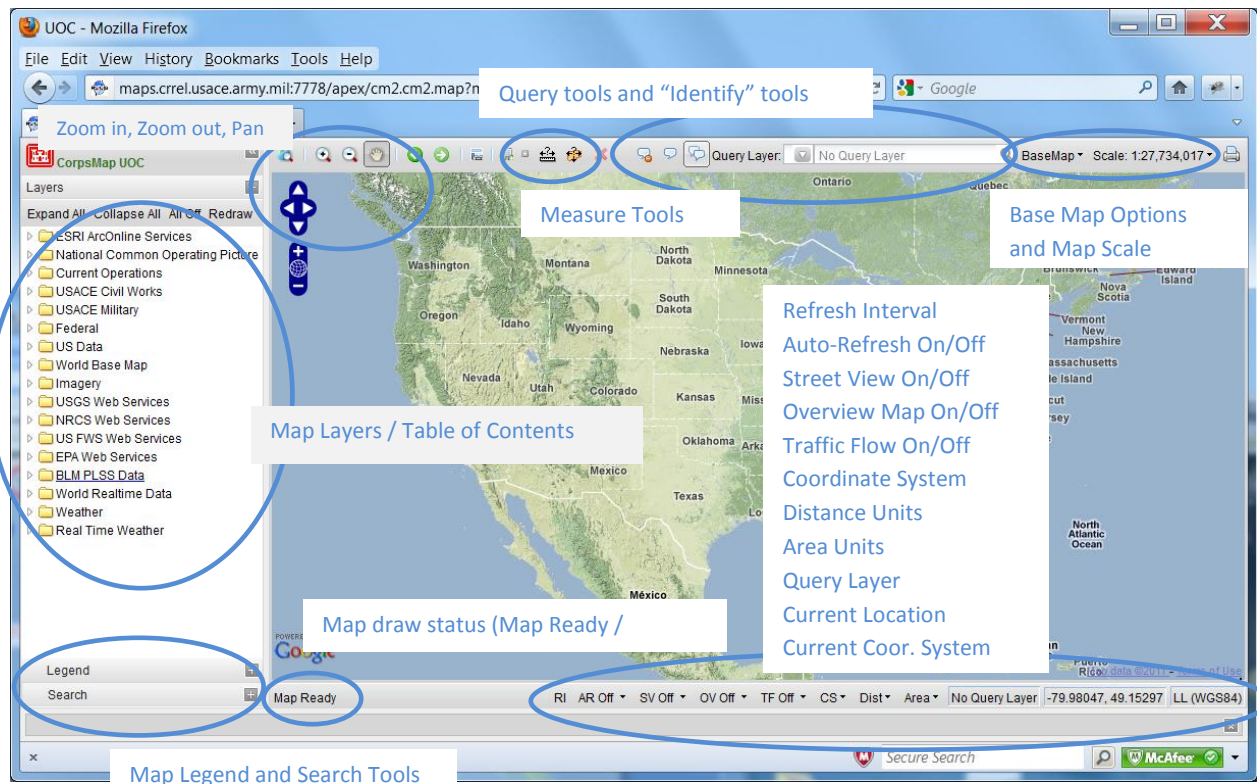
Quick Tour of CorpsMap:

Zooming in and out: use the buttons in the upper left corner of the map on the “Upper menu bar”

Current Map scale: displayed in the upper-right hand corner on the “Lower menu bar”

Map layers: in the left-hand pane, under “Layers”. Many layers are located in sub-folders. The right-hand pane also has buttons to show the map legend and query results, as well as a built-in search box to search by zip code, city, coordinates or a Google search

Legend: Below the “Layers”, on the left-hand side. Legends will be displayed for any active layers that have legend information associated with them.



Map Layer names will sometimes appear gray in the Layers section. This indicates that the layer is not available at the current scale and cannot be shown. Typically zooming in or zooming out will allow for the layer to be turned on.

CorpsMap Features, Tools and Buttons

Navigating in the map



Top menu bar



Click this button to Zoom to the full extent of the map



Click this button to zoom in. First click the tool to make it the active tool, then either click once in the map to zoom in, or click and hold the left mouse button, drag the mouse in the map window and release the mouse to zoom in to a specific area defined by the box that is drawn (also known as click-and-drag)



Click this button to zoom out. First click the button to make the tool active, then either click once or click and drag to zoom in.



Pan Tool. Click this button, then click and hold down in the map to pan or slide the map east, west, north or south.



Previous Extent. Click this button once to return to the previous map scale and view



Next Extent. Click this button once to advance to the next map scale (assuming you have already clicked the “previous” button)



“Get Coordinates at Point”. Click this button and then click in the map to retrieve the coordinates at the given point.

Scale: 1:54,168 ▼

Change the scale of the map.



Quick pan, zoom, extent tools. Single click to pan, zoom at pre-set scales. Globe returns to full extent.



Print the map

BaseMap ▼

Change the underlying basemap. Options are USGS Topographic Maps, Google Hybrid (imagery and roads), Google Satellite (Imagery), Google Terrain (shaded relief with rivers, lakes, etc). More imagery and backdrop layers can be found under the “Imagery” folder in the “Layers” portion of the web page on the left-hand side.

Measure Tools:



Measure distance tool. Note: Distance is measured based on a Spherical Mercator projection. Distances may vary depending map projection and accuracy of measurement.



Measure Area tool. Note: Area measured is based on Spherical Mercator projection. Area can vary depending on map projection and accuracy of measurement.

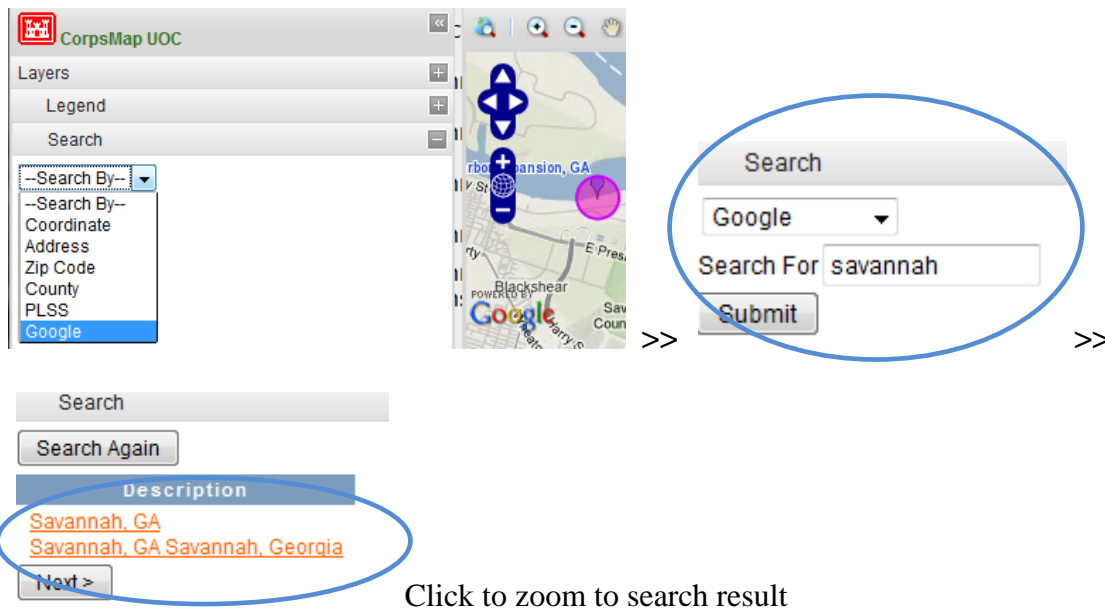


Clear Measurements

Map Search Tools

CorpsMap has various ways to search for a geographic location, including:

1. By Coordinate Pair
2. Address
3. Zip Code
4. County
5. PLSS (Public Lands Survey System) Section, Township and Range
6. Google Search (Google Maps search)



Click to zoom to search result

Search and Query Tools for finding locations and information:

CorpsMap's search and query tools allow the user to identify items in certain layers of the map and find out more details about them.

Many layers in CorpsMap are "queryable". A few examples are:

1. Corps Dams
2. Corps Project Notebook
3. Stream Gages

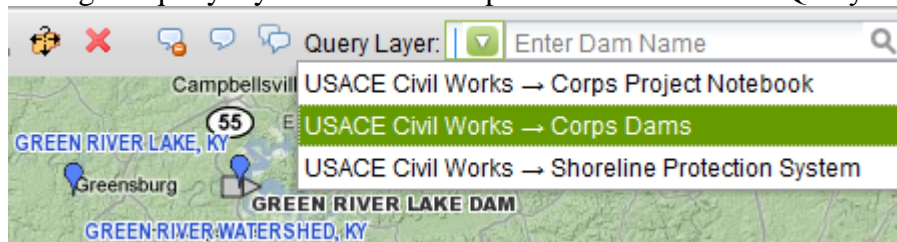
The first step to querying a GIS layer for more information is to set the "query layer"



Use the drop-down arrow to the right of

"Query Layer:" to set the query layer. At least one queryable map layer must be turned on for the list to show a layer.

Setting the query layer. Click the drop-down arrow next to "Query Layer" on the top menu bar.



A simple example is finding the location of a Corps dam by entering the dam name. Once the dam is located, you can query the dam to find out what year the dam was completed, and when it was last inspected.

In the query layer box, begin typing the name of a dam. An example is McNary Lock and Dam. As you begin to type, CorpsMap will display a list of dams containing the text characters you have typed.

Once a query layer is established, the following buttons can be used to query the layer for more information:



Pop-up Query. Click this tool, then click on an item in the map, to return information about that item. Note: A Query Layer must be set, and the location clicked must have an item from that layer in that location for an info query box to be displayed.



Clear all queries



Table Query. Used to pull back information for more than one item in the map

Pop-up Query result example:

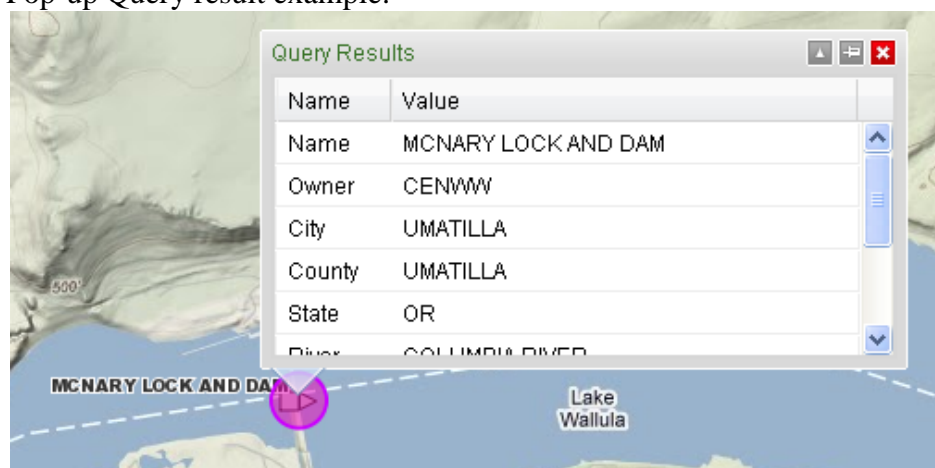



Table Query Results

Note: When using the single-query or table-info query tools, please be patient with the map and the selection process. Table-info queries can take 30 seconds or more to be selected in the map and shown in the table.

Use the zoom tools to find a location where the query layer has some features in the map.

Click the “” table-info query button. Press and hold the left mouse button and drag a box across the map over some of the features in the layer. The items in the query layer will be “selected” now and show up with a magenta circle around them. Also, a “Query Results” box will appear at the bottom of the web page, with information for each selected feature.

UOC - Mozilla Firefox

maps.crrel.usace.army.mil:7778/apex/cm2.cm2.map?map=UOC

Query Layer: Enter Dam Name BaseMap >>

Layers

- Expand All Collapse All All Off Redr
- ESRI ArcOnline Services
- National Common Operating Pict
- Current Operations
- USACE Civil Works
 - Corps Project Notebook
 - All NID Dams
 - DTOS Home Locations
 - ☒ Corps Dams
 - Corps Reservoirs
 - Hydroelectric Dams
 - Coastal Inventory Database

Legend

Search

Map Ready RI AR Off SV Off OV Off TF Off CS Dist Area Corps Dams -118.61115, 46.33934 >>

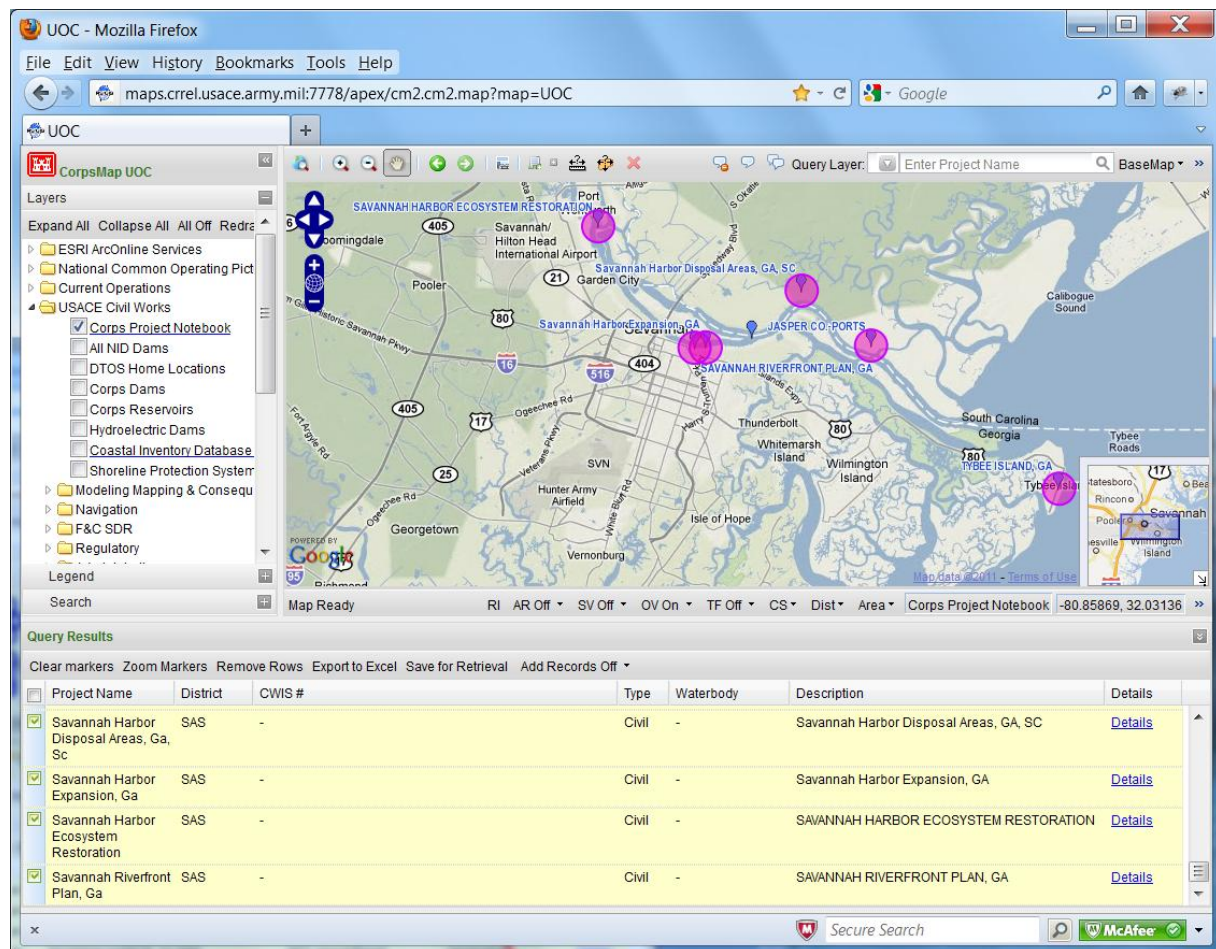
Query Results

Clear markers Zoom Markers Remove Rows Export to Excel Save for Retrieval Add Records Off >

<input type="checkbox"/>	Name	Owner	City	County	State	River	Year Completed	Inspection Date
<input checked="" type="checkbox"/>	MCGREGORY DAM	MACGREGOR LAND & LVSTK	AYER	WHITMAN	WA	TR-PALOUSE RIVER	1950	-
<input checked="" type="checkbox"/>	LOWER MONUMENTAL LOCK AND DAM	CENWW	PASCO	FRANKLIN	WA	SNAKE RIVER	1969	04/2006
<input checked="" type="checkbox"/>	LITTLE GOOSE LOCK AND DAM	CENWW	PASCO	COLUMBIA	WA	SNAKE RIVER	1970	05/20/2008
<input checked="" type="checkbox"/>	LOWER GRANITE LOCK AND DAM	CENWW	PASCO	WHITMAN	WA	SNAKE RIVER	1975	05/2006

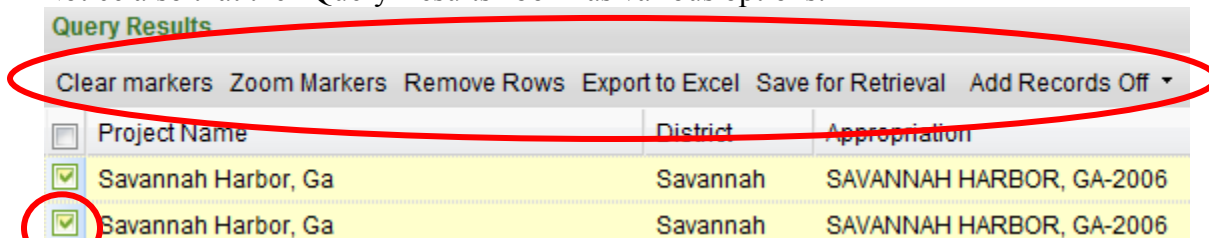
Secure Search McAfee

Occasionally query results will have hyperlinks to more information. If so, the field will be underlined and in blue text:



To view more details about the particular item, click on the “[Details](#)” hyperlink in the table.

Notice also that the “Query Results” box has various options:



Options include:

- Exporting the table to Microsoft Excel / Comma Separated format (.csv)
- Saving the search details in a URL (copy and paste the exact URL that will allow you to email or save a link to this map and query)
- “Add Records On” allows you to add rows to the existing selection set. “Add Records Off” will replace the existing rows in the selection.
- Zoom markers: zooms to the selected markers
- Clear markers: clears the markers, but not the query rows, from the map (good for printing)

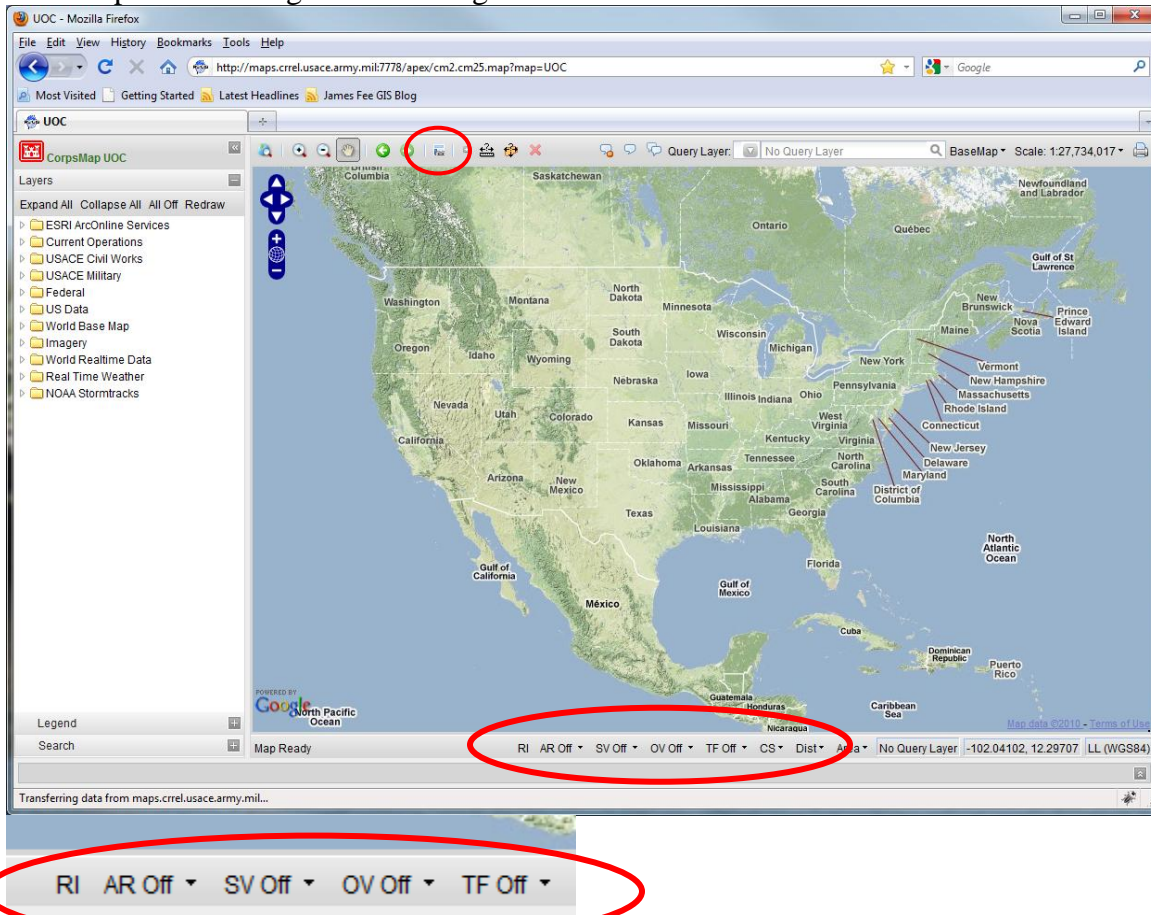
The Check box at the beginning of a row (☒ Savannah Harbor) allows you to add or remove from selection set (shown in yellow). To select multiple rows/records, press and hold the “**Ctrl**”

button and then click the checkbox. To select a group of adjacent rows, click the box on the first one, then press and hold the “**Shift**” button and click the last record’s check box.

Other tools:

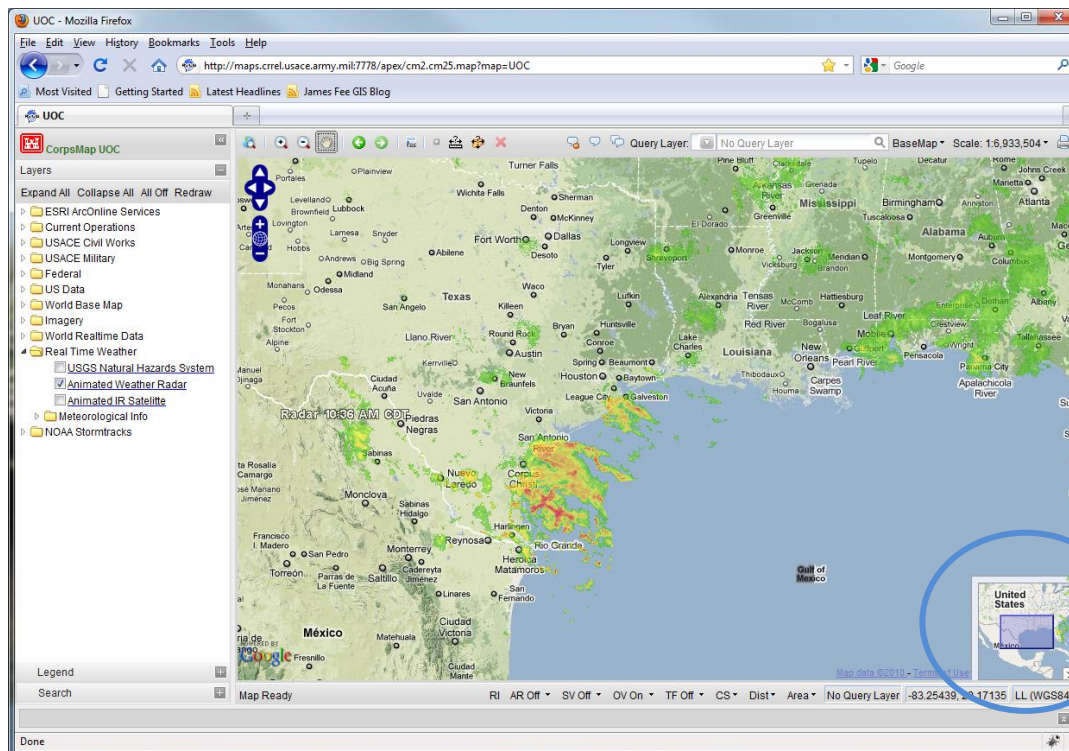


Click this button to display a “permalink” that will allow you to copy and send a web link (URL) so that this location on the map can be easily found again. The permalink tool is located on the top bar to the right of the navigation tools




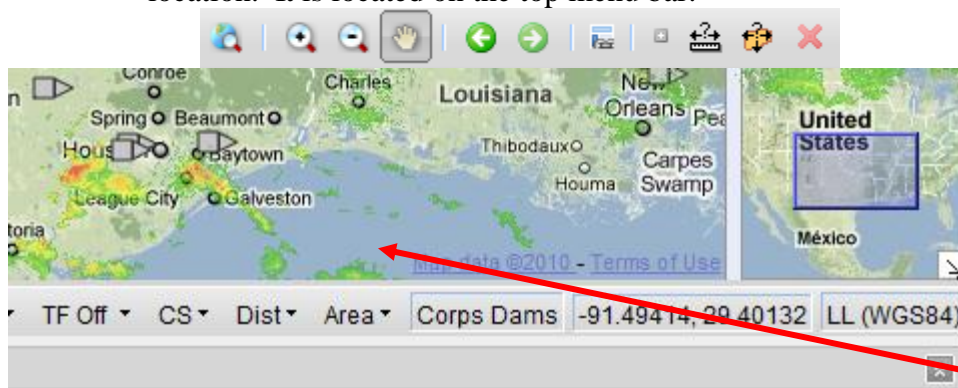
Lower bar commands:

- RI: click this button to change the map refresh time interval. Refresh values are in minutes
- AR: Turn On or Turn Off Auto-refresh of the map
- SV: Turn on or off Google Street view
- OV: Turn on or off an overview map. This tool functions only when a Google basemap option is chosen. See example below:



Overview map

- TF: Turn on or off “Traffic Display”. Tool only works when a Google basemap option is chosen.
- CS: Coordinate System Display. NOTE: changing the coordinate system DOES NOT change the map projection. The map projection is fixed in a spherical Mercator projection. Current coordinates display for the location of the mouse cursor in the map (Longitude first, Latitude Second). Current coordinate spatial reference framework is displayed just to the right of the coordinates. LL= Longitude, Latitude and WGS84 = World Geodetic System 1984 (Datum)
- Note: Use the “Get Coordinates” tool  to get the exact coordinate of the cursor location. It is located on the top menu bar:



Query Layer

Indicator, Coordinates and Coordinate Spatial Reference

- Dist: Set the distance units for measuring distance.
- Area: Set the area units for measuring area.

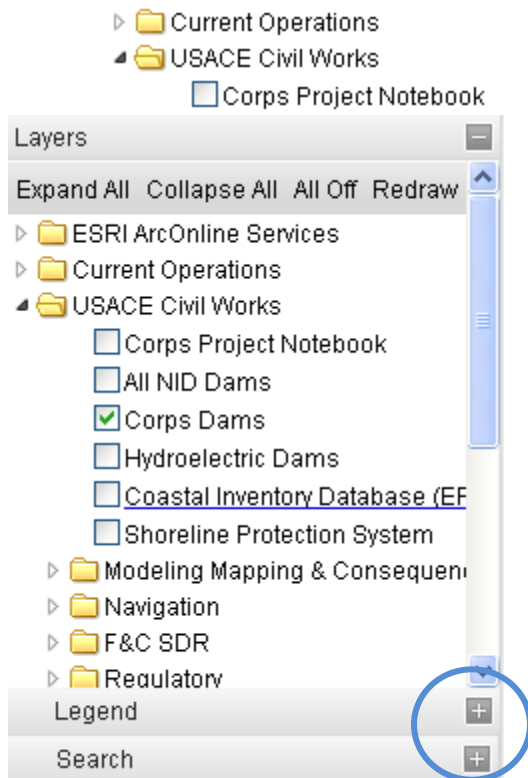


Show / Hide Query

Results


Layers and Legend

“Layers” panel on left-hand side of browser window. Expand folders by clicking the arrows on the left. Turn layers on and off by clicking in the checkbox. Click hyperlinked layers for more information on the layer.

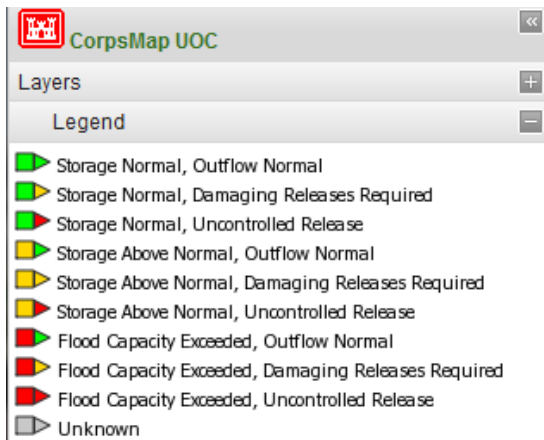


Show / Hide Legend, Search, Layers (buttons toggle

between + and -)

“Legend” panel on left hand side of the browser (click the  symbol next to Legend to expand the legend)



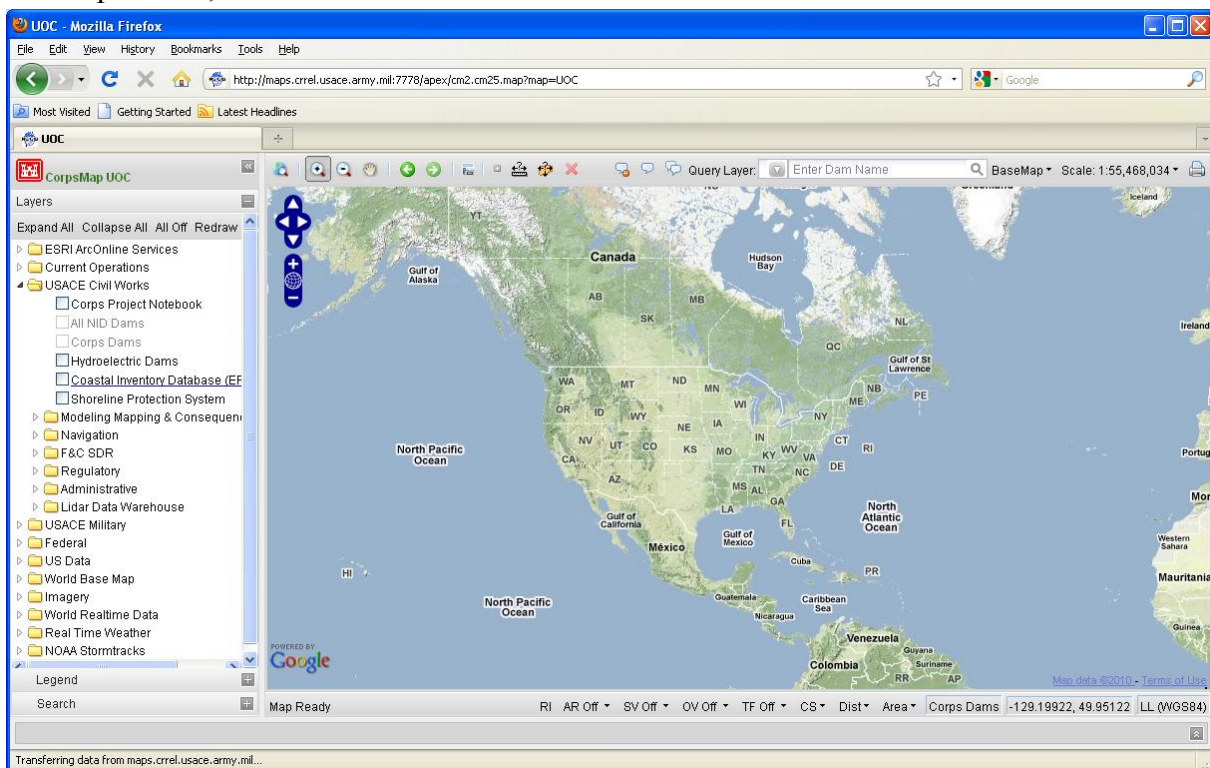


A Sample Exercise Using CorpsMap:

Navigate to <https://corpsmap.usace.army.mil> and then click on “The CorpsMap Viewer”

When the map loads, look under the “Layers” box on the left-hand side of the web page, and then click the arrow to the left of the “USACE Civil Works” folder.

If you don’t see the layers on the left side of the screen, click the “Layers” button on the left to show the map layers. Expand the folder “USACE Civil Works”. Notice that the layer “Corps Dams” is “grayed out”. This means that the layer is not visible at this scale. To be able to see the Corps Dams, we’ll need to zoom in.



Click the “Zoom In” tool, and then click-and-drag a box around the state of Washington in the northwest. Take a look at the map scale in the upper right corner. Remember that with map scale, “Large is small” – because map scale is a ratio or fraction.

Map scale is the relationship between distance on the map and distance on the ground, and is usually expressed as a ratio, such as 1:24,000 or 1/24,000. So, 1 inch on the map represents 24,000 inches (2000 feet, or about 0.4 miles) on the ground. A 1:63,360 map has 1 inch on the map exactly equal to 1 mile on the ground.

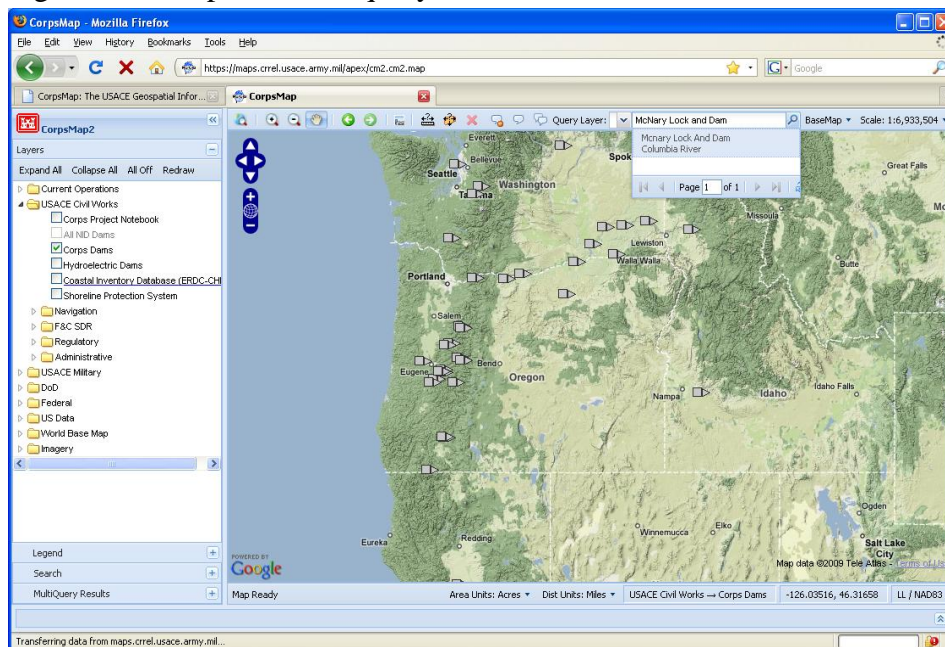
Zoom in to the State of Washington.

In the upper right corner, if your scale is larger than 1:15,000,000, the “Corps Dams” layer should be black in the table of contents now.

Click the checkbox next to “Corps Dams” to turn on the layer. The map will take a moment to re-draw, but when it is done, it should show Corps Dams using a gray icon in the map.

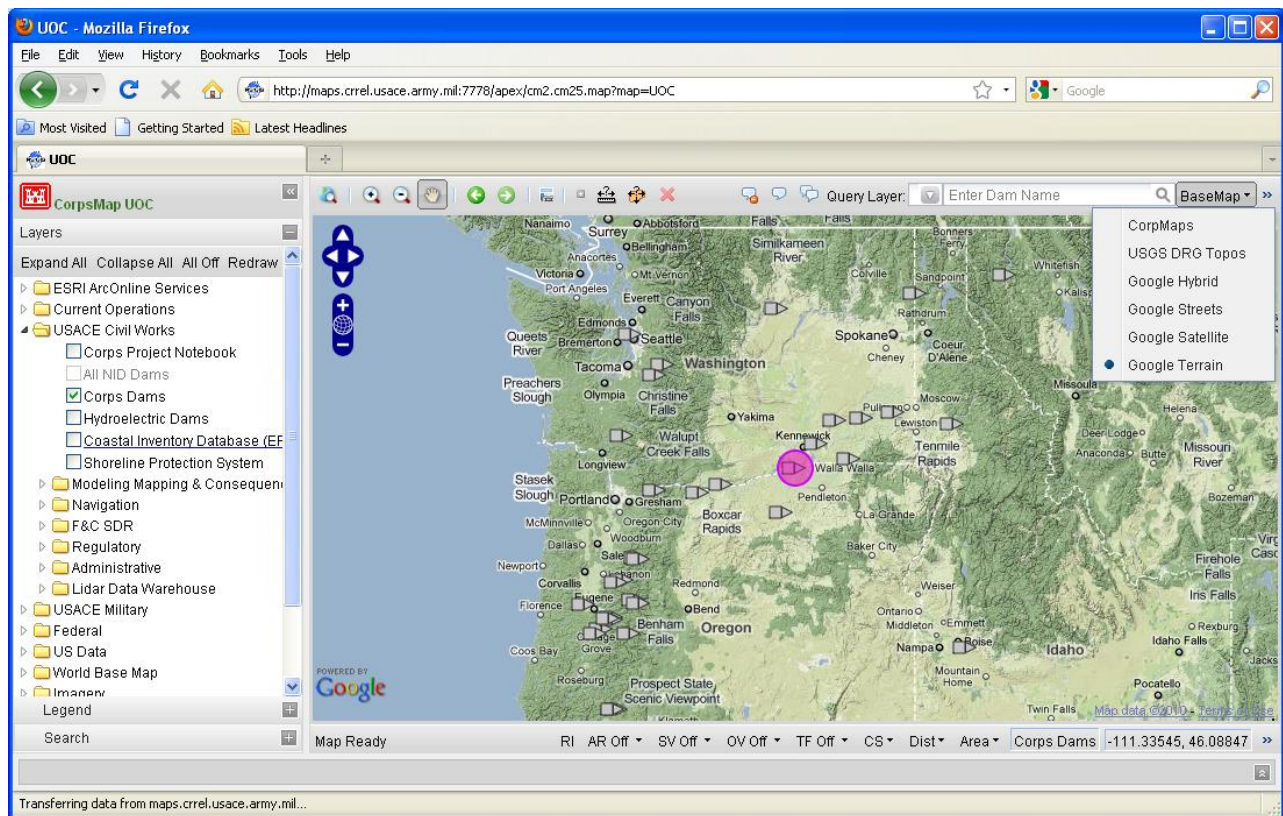
Notice also that the box next to “Query Layer” in the upper bar of the map has changed to read “Enter Dam Name”, instead of reading “Set Info Layer”.

In the “Query Layer” box, type **Mcnary Lock and Dam** As you type, a dam or list of dams may begin to show up under the query box:

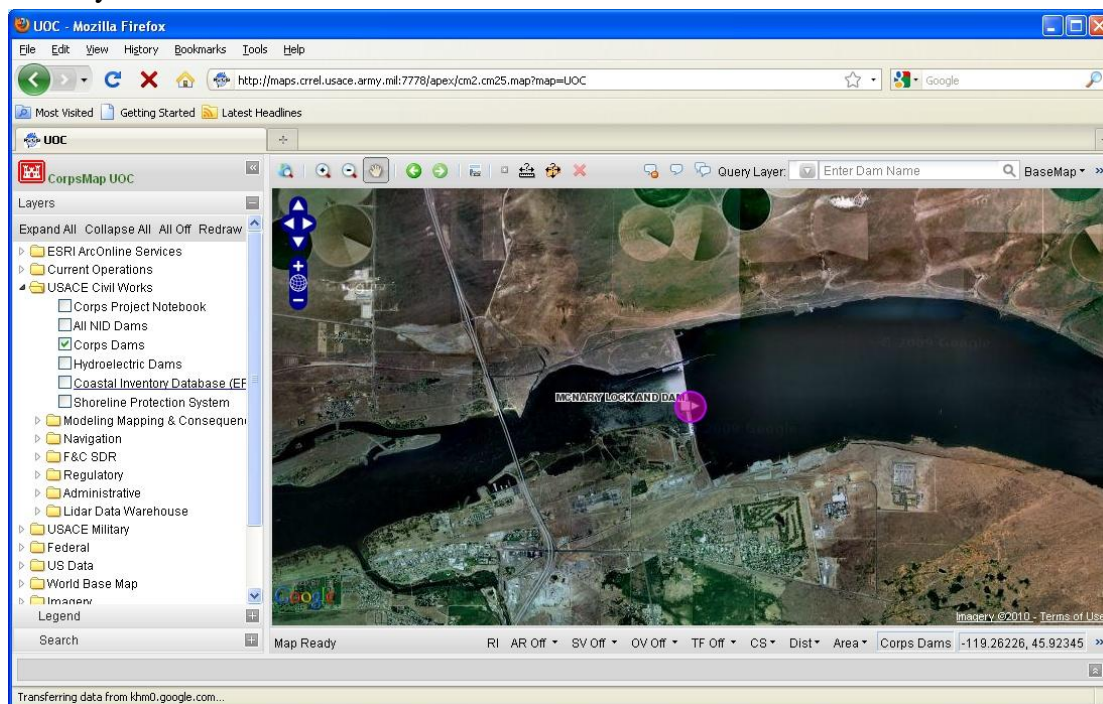


Once you’ve typed in the words and results pop up under the query box, use the mouse to click on “Mcnary Lock and Dam”. The map will then zoom in automatically to the McNary Lock and Dam on the Columbia River along the Washington-Oregon border.

The map may zoom in “too close” for the Google Terrain layer to be displayed. If this is the case,



McNary Lock and Dam:

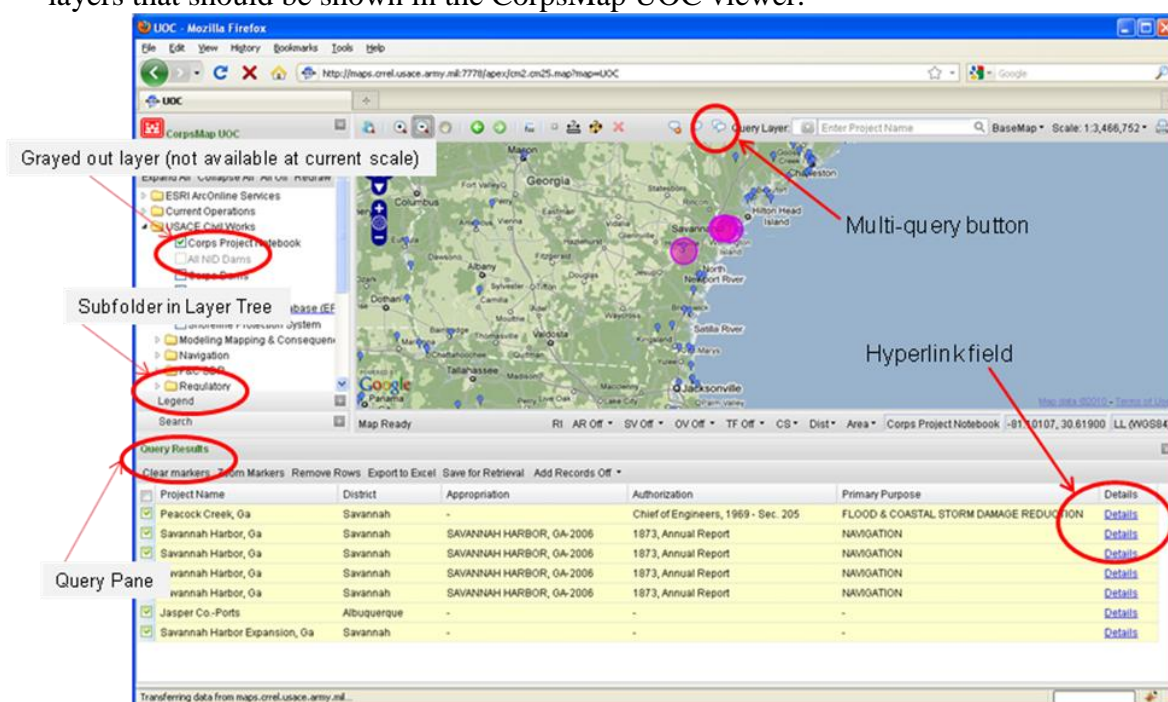


If the map zooms in too far, just use the zoom tools, the “return to previous view”, the scale drop-down list or the “full extent” button to display the map at the scale you prefer

End of sample map exercise.

CorpsMap Features and Advantages

- CorpsMap has multiple backdrop displays such as terrain, streets and roads, imagery and hybrid backdrops
- CorpsMap ties directly in to Corps-wide databases such as the National Inventory of Dams, OMBIL Regulatory Module and other databases. Many of these links show real-time updates and changes, and tie these databases to geographic locations
- CorpsMap has direct links to real-time data sources such as NOAA weather, USGS stream gages. Data layers come from FEMA, EPA, NOAA, National Park Service, US Fish and Wildlife (critical habitat, national wetlands inventory, USGS
- CorpsMap is flexible and customizable. Most GIS layers that can be served out to the web can be displayed in CorpsMap. Contact your local CorpsMap GIS Administrator at your district or division for local layers, or contact the RS/GIS center for proposing layers that should be shown in the CorpsMap UOC viewer.



Appendix 1: CorpsMap Frequently Asked Questions

Q: What web browsers work with CorpsMap?

A: CorpsMap has been tested with Internet Explorer, Firefox and other browsers. Firefox 3.6 is optimal, Internet Explorer 8 is the preferred version for Internet Explorer.

Q: Why does CorpsMap limit the number of map scales?

A. The Google Maps background layers limit the map scales to the options seen in the map scale list. Due to the vast amount of data in these layers, a choice was made to show these layers at a limited number of scales. By doing so, the map tiles can be “cached”, or created and stored ahead of time and allow for faster display.

Appendix 2: Map Scales

Map scale is the relationship between distance on the map and distance on the ground, and is usually expressed as a ratio, such as 1:24,000 or 1/24,000. So, 1 inch on the map represents 24,000 inches (2000 feet, or about 0.4 miles) on the ground. A 1:63,360 map has 1 inch on the map exactly equal to 1 mile on the ground.

So, a 1:63,360 map, where 1 inch on the map represents 1 mile on the ground, is a larger-scale map than a 1:316,800 map, where 1 inch represents 5 miles on the ground.

The scale used for most US topographic mapping is 1:24,000. This is a fairly large-scale map, and detailed information such as buildings, large and small roads, campgrounds, trails and ski lifts can be drawn at this scale.

Small-scale maps (1:250,000 and smaller) have the ability to show large areas on a single map sheet, but less detail can be shown at this scale. Generally, major roads, larger streams and rivers, railroads and boundary lines are shown at this scale, but other details are not shown.

Appendix 3: Web Browsers

Mozilla Firefox Version 3.6.10: <http://www.mozilla.com/en-US/>

Internet Explorer 8: <http://www.microsoft.com/windows/internet-explorer/worldwide-sites.aspx>

Appendix 4: Glossary of Terms

- Geographic Information System – a system for compiling and distributing geographic information
- Layer / Map Layer – a single layer or “theme” of a map. Examples might include “roads” or “congressional districts”. Some map layers are composed of individual features, such as roads, while other layers are composed of pixels of data such as satellite imagery.
- Query – A query is way to access the information behind the map that is contained in the GIS database. Querying a Corps of Engineers Dam might result in displaying information about when the dam was constructed and when it was last inspected.
- Map Projection – Map projections are two-dimensional representations of our three-dimensional earth. Certain elements of maps are skewed by map projection - a necessary result of viewing a three-dimensional surface in two dimensions (paper maps and computer screens are both two-dimensional).
 - CorpsMap uses a spherical Mercator map projection. This is the same map projection used by Google Maps, Bing Maps and ESRI ArcGIS Online resources layers.
- Spatial Reference Framework – The spatial reference framework of a map or map layer is the map projection and the underlying datum used. Datums are approximations of the earth’s three-dimensional shape, while projections are ways of viewing that three-dimensional surface in two dimensions. CorpsMap uses the World Geodetic System 1984 (WGS84) datum.

Appendix 5: CorpsMap Administrator configuration notes

CorpsMap Components:

Oracle Database

Apache Webserver (with the “mod_plsql” module installed, which allows one to create web applications using Oracle). See http://www.orafaq.com/wiki/Mod_plsql_FAQ for details)

Mapserver, which is a free, open-source web-rendering engine for spatial data (see www.mapserver.org)

CorpsMap components are available on the forge.mil site (<https://software.forge.mil>) under the CorpsMap group. Discussion forum, code, layer configuration examples are also available.

Various Javascript libraries, including:

- OpenLayers (see www.openlayers.org)
- Google Maps API (see <http://code.google.com/apis/maps/index.html>)
- GeoExt and ExtJS javascript libraries
 - o GeoExt imbeds a map with interactive navigation controls (see www.geoext.org/tutorials/quickstart.html)
 - o ExtJS is a cross-browser javascript library for building rich internet applications (see www.sencha.com/products/js)

CorpsMap’s program flow can be described as follows:

- Web request is sent to Apache and Apache’s “mod_plsql” module
- The CM2(5) Oracle PL/SQL package is invoked with parameters, dynamic javascript and static javascript sent to the browser
- The initial map request is then sent to MapServer
- Google Maps API request

Once the information is loaded in to the browser:

- Map Draw requests such as panning and zooming go simultaneously to:
 - o Google Maps API
 - o Mapserver
 - o Underlay / Overlay layers
 - Map query requests are:
 - Sent to Oracle CM2 package’s “geojson” procedure
 - o Mapconfig and Maplayer Oracle tables control the map configurations and the various map layers and folders that appear in the CorpsMap table of Contents.
 - Use the “INC_MAPNAME” and “EXC_MAPNAME” to specify which map application should display the folder
 - Other columns can be left blank for folders